DOCUMENT RESUME

ED 387 360 SE 056 945

TITLE	Excelling in Math and Science: Selected Programs of the U.S. Department of Education.
INSTITUTION	Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO	AD-95-1004
PUB DATE	Jul 95
NOTE	36p.
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Educational Change; Elementary Secondary Education; *Federal Programs; *Mathematics Education; *Science Education; Technology Education
IDENTIFIERS	*Department of Education; *Reform Efforts

ABSTRACT

The National Education Goal on Math and Science is that by the year 2000, U.S. students will be the first in the world in mathematics and science achievement. The programs in this booklet reflect the various aspects of U.S. Department of Education's efforts to support the achievement of this goal as well as its commitment to comprehensive education improvement based on high academic standards. These programs support math, science, and technology education, either directly or indirectly, in various ways. They cover support for state and local reform, education research, information clearinghouses, and scholarships in selected areas, under the following topics: school improvement; professional development; technology; development and demonstration; research and statistics; information; recognition; and scholarships, fellowships, and related aid. (MKR)

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ED 387 360

Excelling in Math and Science

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Selected Programs of the U.S. Department of Education

Excelling in Math and Science

Selected Programs of the
U.S. Department of Education

U.S. Department of Education
Richard W. Riley
Secretary

July 1995

The National Education Goal on Math and Science

By the year 2000, U.S. students will be first in the world in mathematics and science achievement.

Objectives

Mathematics and science education will be strengthened throughout the system, especially in the early grades.

The number of teachers with a substantive background in mathematics and science will increase by 50 percent.

The number of U.S. undergraduate and graduate students, especially women and minorities, who complete degrees in mathematics, science, and engineering will increase significantly.

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The Goal

When the nation's leaders decided in 1990 that American students would be first in the world in math and science achievement by 2000, it was not a casual goal. It was a recognition that our nation is rapidly shifting to a society based on information and technology. It was a nod to the connection between math and science learning, and learning in other core subjects. And it was an acknowledgment that our students were performing below world-class standards at various grade levels on international tests, even as our scientists continued to lead the world in their achievements. Setting that goal—as with all of the goals—was a call to action for the nation.

Since 1990, the Department of Education's involvement with math, science, and technology education has grown considerably. We have begun a collaborative partnership with 15 other federal agencies to strengthen overall federal support in these areas. We have established a Steering Committee for Mathematics and Science, as well as a Special Advisor on Education Technology, attached to the Secretary of Education's office. Congress has enhanced our role by adding new, targeted programs. The result is a renewed focus on what schools and teachers need to help our students excel in mathematics, science, and technology.

What's Inside

The programs in this booklet reflect the various aspects of the Department of Education's commitment to comprehensive education improvement based on high academic standards. These programs support math, science, and technology education, either directly or indirectly, in various ways. They cover support for state and local reform, education research, information clearinghouses, and scholarships in selected areas, under the following topic areas:

- School Improvement
- Professional Development
- Technology
- Development and Demonstration
- Research and Statistics
- Information
- Recognition
- Scholarships, Fellowships, Related Aid

Since many of the programs include competitive as well as formula grants to states and local school systems, almost all mathematics and science teachers have the opportunity to benefit from additional education which, in turn, enhances the academic achievement of their students. States and institutions of higher education have risen to the goal's challenge by collaboating on new curricula designs and teaching methods.

Taken together, the programs in this booklet significantly enhance the prospect that American students will reach the science and mathematics goal by the year 2000.

School Improvement

Goals 2000. This program provides grants to states, school districts, and schools to develop and put in place comprehensive, standards-based school improvement plans. The 5-year funding, which began in FY 1994, helps support new or ongoing improvement plans. Local districts receive most of the improvement funding. The program encourages high academic standards in the core academic subjects, including math and science, and promotes the use of education technology. The main aim of these reforms is to help states and communities reach the eight National Education Goals. Contact: Goals 2000, U.S. Department of Education, Room 4000 Portals Building, 600 Independence Avenue SW, Washington, DC 20202–6150, (202) 401–0039.

Fund for the Improvement of Education (FIE). The FIE awards grants to state and local education agencies, institutions of higher education, and other public and private organizations. These grants support nationally significant programs to improve the quality of education,

assist all students to meet challenging state content and student performance standards, and contribute to the achievement of the National Education Goals. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5524, (202) 219–1301.

Innovative Education Program Strategies. This program underpins state and local endeavors to reach the National Education Goals by funding efforts to implement promising education reforms. States and districts have wide flexibility—targeting, for example, the special needs of at-risk and high-cost students, or providing a continuing source for innovation through library services, and instructional and media materials. Grants go to state education agencies, with 85 percent in subgrants passing through to local agencies. Contact: School Improvement Office, Office of Elementary and Secondary Education, U.S. Department of Education, Portals Building, 600 Independence Avenue SW, Washington, DC 20202–6140, (202) 260–2551.

Magnet Schools Assistance. These grants go to local education agencies implementing approved desegregation plans, either required or voluntary. The program has four purposes: to support the elimination, prevention, or reduction of minority group isolation in elementary and secondary schools; to support projects that will help achieve systemic reforms and help all students meet challenging state content and performance standards; to support innovative educational practices; and to support instruction that strengthens students' academic knowledge and grasp of viable vocational skills. Contact: Magnet Schools and Desegregation Programs, Office of Elementary and Secondary Education, U.S. Department of Education, Portals Building, 600 Independence Avenue SW, Washington, DC 20202–6140, (202) 260–2476.

Science Standards. The National Research Council of the National Academy of Sciences, with a grant from the Eisenhower National Program, is developing science content standards for students, grades K-12. Science educators, scientists, and the general public are extensively involved, reviewing and refining the standards. More than 100 organizations serve as liaisons to the project.

Separate working groups, funded by a coalition of other federal agencies, are developing teaching and assessment standards in close cooperation with the content standards groups. Contact: Director of Critique and Consensus, Natural Science Education Standards and Assessment, 2101 Constitution Avenue NW, MA 487, Washington, DC 20419, (202) 334–1399.

State Standards and Curriculum Frameworks. Most states and the District of Columbia have received grants to help develop and implement K-12 academic standards or curriculum frameworks to clarify what, when, and how to teach the core academic subjects. The state efforts are building on existing and emerging standards to ensure that all children study challenging subject material. The projects are also designing and implementing new approaches to teacher education and certification appropriate to the standards/frameworks. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5645, (202) 219–2187.

Title I, Part A, of the Improving America's Schools Act of 1994. These formula grants go through state education agencies to local agencies to improve educational opportunities for educationally disadvantaged students. Programs focus on improving teaching and learning to enable students to meet high academic standards, and support extended-day programs, effective transition from preschool to school, greater parental participation, and schoolwide programs. Title I programs are expected to benefit more than 50,000 schools and 5 million students in high-poverty areas. Contact: Compensatory Education Programs, Office of Elementary and Secondary Education, U.S. Department of Education, Room 4400 Portals Building, 600 Independence Avenue SW, Washington, DC 20202–6132, (202) 260–0826.

Professional Development

Eisenhower Federal Activities. This program supports projects of national significance that contribute to the development and implementation of high-quality professional development activities. The program's original focus was mathematics and science; in 1995 it expanded to include all core academic subjects. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5650, (202) 219–2206.

Eisenhower Professional Development Program (State Formula Grants). This program awards grants through the states to local school systems in support of sustained and intensive, high-quality professional development in the core academic subjects in the nation's elementary and secondary schools. One key aim is to increase students' opportunity to achieve challenging state content and performance standards. Grants also are awarded to institutions of higher education and nonprofit organizations through state agencies for higher

education. Contact: Eisenhower Professional Development Education Program Branch, Office of Elementary and Secondary Education, U.S. Department of Education, 600 Independence Avenue SW, Washington, DC 20202–6140, (202) 260–1907.

Regional Technical Support and Professional Development Consortia. The six regional consortia develop programs that offer professional development, technical assistance, and information resource dissemination. The main aim of these programs is to help states, local districts, teachers, and others successfully integrate advanced technologies into elementary and secondary classrooms, library media centers, adult literacy centers, and other learning environments. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5650, (202) 219–8070.

Teacher Networking Project. This project explores various approaches to using electronic networks as tools for teacher professional development. A major grants competition supports model projects in this area, particularly applications of high-performance computing.

Currently, 15 projects serve 673 teachers in 84 schools. Several projects focus on mathematics and science education, and most work with at-risk students. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5645, (202) 219–2053.

See also:

Christa McAuliffe Fellowship in the Scholarships section; and

National Center for Research on Teacher Learning in the Research and Statistics section.

Technology

National Challenge Grants for Technology in Education. These grants go to consortia working to improve and expand new applications of technology to strengthen school reform. Grantees stress improving student achievement and providing sustained professional development of teachers, administrators, and school library media personnel. Contact: Interagency Technology Task Force, 600 Independence Avenue SW, Washington, DC 20202–5544, (202) 708–6001.

Star Schools. This program funds partnerships that use telecommunications and other technologies to improve educational opportunities for students in mathematics, science, foreign languages, literacy skills, vocational education, and other subjects. Services, including programming and equipment, have been provided to schools and communities serving students in both rural and urban areas, using technologies that include satellite, fiber optics, compressed video, facsimile, computer networks, and cable. In 1994–95, Star Schools projects served almost

1,650,000 participants. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5645, (202) 219–2116, E–mail: cgarnett@inet.ed.gov.

Telecommunications Demonstration Project for Mathematics. This project is a national communications-based effort designed to assist elementary and secondary school teachers in preparing students for achieving state content standards. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5650, (202) 219–2181.

See also:

Regional Technical Support and Professional Development Consortia and **Teacher Networking Project** in the Professional Development section.

Development and Demonstration

Eisenhower Regional Mathematics and Science Education Consortia. The 10 consortia, working closely with the Eisenhower Clearinghouse, offer information and technical assistance to help states and school districts provide improved mathematics and science programs in accordance with high academic standards. They also train and provide technical assistance to classroom teachers, administrators, and other educators to help them adapt and use exemplary instructional materials, teaching methods, curricula, and assessment tools. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5644, (202) 219–2206.

Fund for the Improvement of Postsecondary Education (FIPSE). These grants support innovative reform projects to improve the quality of teaching and student learning and to insure equal educational opportunity at the postsecondary level. Funded projects are intended to be models that advance practice by being disseminated

nationally. In mathematics and science education, FIPSE supports projects involving curriculum reform, new uses of technology, teacher preparation, and more. Eligible applicants include 2- and 4-year colleges and universities, consortia, associations, nonprofit corporations, and others. Contact: FIPSE, Office of Postsecondary Education, U.S. Department of Education, 600 Independence Avenue SW, Washington, DC 20202–5134, (202) 708–5750.

Jacob K. Javits Gifted and Talented Students Education Grants. These demonstration grants fund activities to help meet the special educational needs of gifted and talented students in elementary and secondary schools. The program also encourages the development of challenging curricula for all students, with special focus on students who are disadvantaged, handicapped, or have limited English proficiency. A current priority includes projects in mathematics and science. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5645, (202) 219–2187.

Minority Science Improvement. This program promotes long-range improvement in science education at predominantly minority institutions of higher education. It supports activities that enhance an institution's capacity for developing and maintaining quality science and technology education programs and that increase the flow of underrepresented ethnic minorities, particularly minority women, into scientific and technological careers. Approximately 31 new awards will be made in FY 1996. Contact: Minority Science Improvement Program, Office of Postsecondary Education, U.S. Department of Education, 600 Independence Avenue SW, Washington, DC 20202–5251, (202) 260–3261.

National Diffusion Network (NDN). The NDN provides a dissemination system that helps public and private schools, colleges, and other educational institutions to improve by sharing successful educational programs, products, and processes that have undergone rigorous evaluation through an effectiveness panel. In 1993–94, NDN programs, serving over 6 million students, were adopted in approximately 35,600 schools. Currently, 89 projects span the content areas of interest to local public

and private schools and reflect most age and ability levels. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20208–5644, (202) 219–2134.

Regional Educational Laboratories. The 10 laboratories carry out applied research and development, dissemination of key information, and special activities to aid public and private nonprofit organizations in their regions. As part of the laboratories' mathematics and science initiative, they are collecting, analyzing, and synthesizing information about curriculum frameworks, performance assessment methods, and successful mathematics and science programs and practices. The laboratories are also substantially involved in the work of the Eisenhower Regional Consortia. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5644, (202) 219–2116.

See also:

Eisenhower Federal Activities, Regional Technical Support and Professional Development Consortia, and **Teacher Networking Project** in the Professional Development section; and

National Challenge Grants for Technology in Education, Star Schools, and **Telecommunications Demonstration Project for Mathematics** in the Technology section.

Research and Statistics

Field-Initiated Studies. This program funds diverse research projects proposed by individuals, institutions of higher education, public and private institutions, and agencies. In fiscal year 1994, the program awarded 11 such grants, including one on mathematics and two on technology in the classroom. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5521, (202) 219–2223.

National Assessment of Educational Progress (NAEP). NAEP has measured the educational achievement of American students for more than two decades. Its 1996 mathematics and science assessments of 4th-, 8th-, and 12th-graders will feature several testing innovations. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5653, (202) 219–1763.

National Center for Research on Cultural Diversity and Second Language Learning. The center addresses the problem of the generally low levels of success in education among linguistically and culturally diverse populations, including low levels of achievement in science and mathematics and subsequent under-representation in these fields. Contact: National Center for Research on Cultural Diversity and Second Language Learning, University of California at Santa Cruz, Kerr Hall, Santa Cruz, CA 95064, (408) 459–3501.

National Center for Research in Mathematical Sciences Education. The center examines the learning and teaching of whole numbers, quantities, algebra, geometry, and statistics. The center also is examining models of authentic assessment and implementation of reform. Contact: National Center for Research in Mathematical Sciences Education, University of Wisconsin at Madison, Wisconsin Center for Education Research, 1025 West Johnson Street, Madison, WI 53706, (608) 263–4285.

National Center for Research on Teacher Learning. The center focuses on teacher skills for increasing the involvement of students in active learning, thus leading to

greater student understanding. Several studies focus on science and mathematics. Contact: National Center for Research on Teacher Learning, Michigan State University, College of Education, 116 Erikson Hall, East Lansing, MI 48824–1034, (517) 355–9302.

National Center for Science Teaching and Learning. The center conducts research to improve science teaching and learning, with special focus on noncurricular, external factors affecting science students and teachers in grades K-12. Among these factors are social and cultural factors; public expectations and societal incentives; school organization, policy, and economic/political forces; new technologies; and content integration. Contact: National Center for Science Teaching and Learning, The Ohio State University, 1929 Kenny Road, Columbus, OH 43210–1015, (614) 292–3339.

National Education Longitudinal Study (NELS:88) of 1988. The National Center for Education Statistics is following a sample of 25,000 8th-graders along with their parents, principals, and teachers during a 2-year cycle. The data collected will allow researchers to examine students' attitudes and enrollment patterns as well as

teachers' instructional patterns. Close attention is given to students' cognitive growth over time, in mathematics, science, reading, and social studies. Contact: Office of Educational Research and Improvement, U.S.Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5651, (202) 219–1777.

Third International Mathematics and Science Study. The National Center for Education Statistics will conduct the U.S. portion of the International Association for the Evaluation of Education Achievement's Third International Mathematics and Science Study, which measures student progress in mathematics and science in more than 40 countries. In 1995 and 1999, each country will measure student proficiency among 4th-, 8th-, and 12th-graders, and 12th-grade specialists in mathematics and science. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5650, (202) 219–1746.

Information

Educational Resources Information Center (ERIC). ERIC is a federally funded, nationwide information network that provides access to educational literature. The ERIC system comprises 25 components that collect, abstract, and index educational material for the ERIC database, and respond to requests for information. Those components include 16 subject-specific clearinghouses, a central processing and reference facility, and a document reproduction service. ERIC also provides a one-stop contact point in ACCESS ERIC, which coordinates outreach, dissemination, and marketing activities; develops system-wide publications; and offers general reference and referral services. Contact ACCESS ERIC at (800) LET-ERIC (538–3742).

ERIC Clearinghouse on Mathematics, Science, and Environmental Education. This clearinghouse, located at Ohio State University, acquires, selects, and processes high-quality printed materials (such as reports, curricula and instructional materials, evaluations, and information

on programs, practices, and policies) in science, mathematics, and environmental education. The clearinghouse provides a variety of services and products to give educators, administrators, researchers, and the public current information on a broad range of issues. Contact: ERIC Clearinghouse for Science, Mathematics, and Environmental Education, The Ohio State University, 1929 Kenny Road, Columbus, OH 43210–1080, (614) 292–6717.

Eisenhower National Clearinghouse for Mathematics and Science Education. The clearinghouse was established to improve access to K-12 mathematics and science resources for teachers, students, parents, and others. It develops and maintains a comprehensive collection and catalog of K-12 curriculum materials. It also ties into a network of existing databases containing catalogs of materials in various formats, text and evaluations of selected materials, and other resources for mathematics and science education. Contact: Eisenhower National Clearinghouse for Mathematics and Science Education, The Ohio State University, 1929 Kenny Road, Columbus, OH 43210–1079, (614) 292–7784.

Recognition

Blue Ribbon Schools. Outstanding public and private schools across the United States are recognized through the annual Blue Ribbon Schools competition. Special honors go to recognized schools that have model programs in specific curriculum areas. The 1993–94 elementary program stressed science and mathematics; the 1994–95 secondary program emphasizes technology. Contact: Office of Educational Research and Improvement, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20808–5650, (202) 219–2149.

Scholarships, Fellowships, Related Aid

Christa McAuliffe Fellowship. This grant program to state education agencies establishes a national fellowship program for outstanding teachers who have 8 or more years of teaching experience. The program encourages McAuliffe Fellows to undertake many challenging activities. One is to develop programs that incorporate the use and sharing of technologies to help students learn. Contact: School Improvement Programs, Office of Elementary and Secondary Education, U.S. Department of Education, 600 Independence Avenue SW, Washington, DC 20202–6140, (202) 401–0659.

Graduate Assistance in Areas of National Need. This program offers graduate fellowships through academic departments of colleges and universities to assist graduate students of superior ability who demonstrate financial need. The purpose of the program is to sustain and enhance the nation's capacity in teaching and research in designated academic areas. In academic year

1995–96, up to 80 awards will be made in biology, chemistry, engineering, mathematics, physics, and computer and information sciences. Contact: Graduate Assistance in Areas of National Need Program, Division of Higher Education Incentives Programs, Office of Postsecondary Education, 600 Independence Avenue SW, Washington, DC 20202–5329, (202) 260–3368.

National Science Scholars. This program provides scholarships to meritorious graduating high school students and General Education Development (GED) recipients to continue their studies at the postsecondary level. The program recognizes students' excellence and achievement in the physical, life, and computer sciences; mathematics; and engineering. Students apply to their state department of education. Contact: Division of Higher Education Incentive Programs, Office of Postsecondary Education, U.S. Department of Education, Seventh and D Streets SW, Washington, DC 20202–5251, (202) 708–4609.

Robert C. Byrd Scholarship. To recognize and promote student achievement, this program makes grants to states to award scholarships for up to 4 years of study at

institutions of higher education. The scholarships go to outstanding graduating high school seniors who show promise of continued excellence. Contact: Division of Higher Education Incentive Programs, Office of Postsecondary Education, U.S. Department of Education, 7th and D Streets SW, Washington, DC 20202–5251, (202) 260–3394.

Ronald E. McNair Postbaccalaureate Achievement. The program offers funding to graduate and undergraduate institutions to support research and other scholarly opportunities for potential graduate students. The program's intent is to promote preparation for doctoral study so that disadvantaged students can participate more effectively in doctoral programs. For academic year 1995–96, about 25 students will benefit in each of 96 institutions receiving an award. Contact: Ronald E. McNair Postbaccalaureate Achievement Program, Division of Higher Education Incentive Programs, Office of Postsecondary Education, U.S. Department of Education, 600 Independence Avenue SW, Washington, DC 20202–5251, (202) 708–4809.

For More Information

For information on U.S. Department of Education programs, call

1–800–USA–LEARN (872–5327).

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The National Library of Education at

1–800–424–1616

or Library@inet.ed.gov.

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